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Meanings or Missed Opportunities? The Implications of Functional Health Literacy for Social Marketing Interventions

Gill Kemp and Lynne Eagle

Bristol Business School
University of the West of England,
Coldharbour Lane, Bristol, United Kingdom
Telephone 01173283439 Fax 01173282289
Email: gill.kemp@uwe.ac.uk lynne.eagle@uwe.ac.uk

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Abstract

Social marketing is hailed as a key tool to help address the myriad health and overall population wellbeing issues facing societies. While there is evidence of the success of specific social marketing interventions, literacy problems within a considerable proportion of the population means that information provided as part of interventions may not be readily comprehended by all members of the target population. The substantial personal and social consequences of low functional literacy levels have been well documented, particularly within the health sector, for over twenty five years, yet information material continues to be produced that is written at a level well above people's average reading ability. The barrier is largely invisible as people with low literacy levels will go to great lengths to avoid acknowledging their problem, due to feelings of shame and the desire to avoid potential embarrassment. There is an ethical responsibility for those involved in designing health-related interventions to improve information provision and comprehension. Without this, considerable numbers of people will be unable to benefit from interventions and may even be at risk due to a lack of comprehension.

A study of the readability of a range of printed and Internet UK health information sources is reported. This indicates that, although the problems associated with low levels of health literacy have been recognised for at least twenty-five years, UK health information material is still written at a level well beyond the ability of substantial sections of the population to understand it. We conclude the paper with a recommendation for further research in the area and for immediate improvement to social marketing-related activity.

Introduction

Andreasen (2002: 7) provides the following definition of social marketing, drawing on a definition originally provided by Kotler and Roberto (1989):

“A social change management technology involving the design, implementation and control of programs aimed at increasing the acceptability of a social idea or practice in one or more groups of target adopters. It utilizes concepts of market segmentation, consumer research, product concept development and testing, directed communication, facilitation, incentives and exchange theory to maximise the target adopter’s response”.

Thus social marketing should be seen not as a specific theory, but rather as a process drawing on an interdisciplinary range of concepts and theories, within which communication is a core component. Social marketing has received increased focus as a result of an acknowledgement that existing educational and communication strategies aimed at improving population health and well being have not been effective (Department of Health, 2004).

A number of recent initiatives developed in several countries place effective communication as the central focus of public health interventions (Bernhardt, 2004) and it is recognised that pan-European and global solutions are being sought to issues affecting health and welfare (Commission of the European Communities, 2002). A UK government white paper *Choosing Health* (Department of Health, 2004) specifically advocated the adoption of the principles underpinning social marketing in order to more effectively promote public health issues.

A UK-based study suggests that treatment of preventable illness amounts to a minimum of £187 billion, equating to 19% of total GDP (gross domestic product) for England alone (National Social Marketing Centre, 2006). A rough estimate of the cost for the EU member states, extrapolating the UK data on the basis of population, is €2,055 billion. In human terms, in the USA, seven of the ten leading causes of death, approximately 1 million deaths per annum are attributable to lifestyle and environmental factors (Petty & Cacioppo, 1996; Rothschild, 1999); again, a rough calculation based simply on population would suggest that the EU statistic would be approximately 1.6 million deaths per annum.

Detailed cross-EU data is somewhat difficult to obtain, however some indications of the magnitude of various health and lifestyle issues in the USA are shown in Table 1; we have no reason to believe that, in the absence of more specific data, the figures cannot be used as a crude indicator of the potential magnitude of similar issues in other developed countries.

INSERT TABLE 1 ABOUT HERE

Social marketing activity is substantially, but not exclusively, focussed on health related issues such as safe sex (Dejong, Wolf, & Austin, 2001; Fishbein, von Haefen, & Appleyard, 2001), smoking cessation (Devlin, Eadie, Stead, & Evans, 2007; Vidrine, Simmons, & Brandon, 2007), immunisation (McDermott, 2000), medical screening (Briss et al., 2004; Cox & Cox, 2001), drug education (Yzer, Hennessy, & Fishbein, 2004) and nutrition / physical activity issues (John, Kerby, & Landers, 2004; Renger, Steinfeld, & Lazarus, 2002).

There is considerable scope for improving population health if effective and cost-efficient means of conveying information are used; indeed, the academic literature contains numerous examples of successful social marketing programmes (Fishbein & Yzer, 2003; Philip Kotler & Zaltman, 1971; McDermott, 2000; Stead, Gordon, Angus, & McDermott, 2007).

However, there is evidence of confusion and misunderstanding in some interventions (Cho & Salmon, 2007); part of the reason is lack of adequate functional literacy (Wallendorf 2001). We therefore firstly review the extant literature regarding the impact of health literacy levels on health outcomes and then report on a study of the relative readability of material from a range of UK health information sources.

Functional Health Literacy Levels

The Organisation for Economic Cooperation and Development (*Gill: need reference*) defines functional literacy as whether a person is able to understand and employ printed information in daily life, at home, at work and in the community. Consistent findings indicate that inadequate literacy adversely affects on medical condition knowledge and ability of patients with chronic conditions to take responsibility for effective self-care (F. H. Wallace, Deming, Hunter, Belcher, & Choi, 2006; Williams, Baker, Parker, & Nurss, 1998; Willimas, Baker, Honig, Lee, & Nowland, 1998). Adverse affects have also been found in relation to preventative screening (Lindau et al., 2002). Varying definitions of literacy make cross-study comparisons difficult, however there appears to be agreement that some 20% of

the population of most developed countries have severe literacy problems and a further 20% have limited literacy (N. R. Adkins & Ozanne, 2005; Office for National Statistics, 2000). There also exists an additional group that could be classed as 'aliterate', in that they are able to read but choose not to, and rely on television rather than print media for news. More importantly, they learn through trial and error rather than by reading instructions (Wallendorf, 2001). The specific needs of these groups must be taken into account, acknowledging their difficulties but avoiding appearing condescending in the design and delivery of appropriate interventions (Guttman & Salmon, 2004).

The major consequence of health literacy problems is cost, as people with low levels of literacy use more health care resources than those with higher literacy abilities (Bar-Yam, 2002; Kefalides, 1999). Health care expenditure due to low health literacy in the USA is estimated at \$US 73 billion and includes longer hospital stays and more frequent doctor visits (Bar-Yam 2002). Extrapolating these figures to the European Union on a simple population ratio basis (Internet World Statistics 2005) would indicate that the costs within the European Union may be in the vicinity of \$US 115 billion, or €77.5 billion.

Table 2 presents the adult reading skill levels for the UK in relation to the primarily American literature (see, for example, Hoffman et al. 2004; Wallace and Lemon 2004; Mumford 1997) and the National Standards for literacy (Department for Education and Skills – DfES, 2003). The *Skills for Life* adult basic skills strategy, launched by the UK Government in 2001, developed national standards for literacy. The literacy framework outlines what an adult should be able to achieve at entry level (divided into three sub-levels), level 1 and level 2 or above. The framework recognises that an adult may be classified at an overall level of literacy but have higher or lower levels of ability in different aspects of that skill. Furthermore, within this framework the skills levels and tests for literacy pertain primarily to reading skills, rather than writing.

INSERT TABLE 2 ABOUT HERE

According to Shea et al (2004), the average adult reading skill level is 3 - 5 grades below the level expected at the end of formal education. Relating this to the UK national curriculum levels, a person who left secondary school at age 16 (reading skill 12, national curriculum 5) can be expected to have a post-education reading skill level of 7 – 9; national curriculum

level 3. The Basic Skills Agency's report (May 2000) reported that almost four out of ten adults in some parts of the UK are functionally illiterate. The Commons Public Accounts Committee (2006) reported that up to 16 million adults, nearly half the UK workforce, have reading skills no better than that of children leaving primary school (Guardian, 2006).

One potential consequence with regards to health information is the possibility of patients or carers being unable to read, or misinterpreting prescription instructions. It is estimated that only 50% of patients suffering from chronic diseases in developed countries follow treatment recommendations, with older people identified as being most likely to be unable to understand prescription instructions (Sabate, 2003; Roman (2004). Implications extend beyond the patient to the wider society in terms of externalities including treatment costs of complications from chronic diseases, formation of resistant infections, or untreated psychiatric illness.

A challenge is identifying the 'functionally illiterate' as such people seldom admit they have a problem and will, over time, have developed numerous strategies to hide the problem (Aldridge 2004; Weir 2001) even from spouses or partners (Aldridge 2004; Roman 2004; Bar-Yam 2002). Known strategies include asking others to read material out, watching and copying the actions of others or stating that they have forgotten their reading glasses and / or will read the material later at home (Aldridge 2004; Bar-Yam 2002).

Despite awareness of the problem, health information materials continue to be produced at a level well above the average reading level (Hoffman et al. 2004(Eagle, Hawkins, Styles, & Reid, 2006)) placing patients at risk for problems due to incorrect or inappropriate medication usage. People with low literacy levels are also more anxious about the possibility of developing cancer, yet are not diagnosed until cancers are advanced (Freidman and Hoffman-Goetz., 2006), raising ethical issues regarding action that should be taken by those who develop material (Cho and Salmon, 2007). Readability is not only an issue related to health; for example, child safety seat instructions are also written at "a reading level that exceeds the reading skills of most American consumers" (Wegner and Girasek, 2003: 588)

People have numerous opportunities to access an abundance of health information, through the media, self-help groups, printed literature and particularly the internet which has given people unprecedented access to health information and health care services online

(Eysenbach, 2000). However, there are concerns regarding the quality of health information on the internet (Cojera, 1998), including peoples' understanding of internet-based health messages (Eysenbach & Deigpen, 1998). A study was therefore undertaken in order to determine the readability of a range of potential UK printed and Internet health information sources.

Study

This study seeks to determine the readability of a range of printed and Internet UK health information sources. A range of health information leaflets from pharmacies was analysed using the SMOG readability index (McLaughlin, 1969) to determine the reading level. The UK funded National Health Service (NHS) Direct website was selected as it has been at the forefront of e-health information services since 2004, with a specific self-help guide able to be interrogated by symptoms or by disease. The Patient UK web site offers free, up-to-date health information as provided by GPs to patients during consultations. In addition website searches were conducted using the Copernic Search Engine for simple search terms for major medical conditions such as asthma and cancer.

The SMOG index was selected because of its proven accuracy, correlation with other readability formulae and subsequent widespread use in the academic literature (Mumford, 1997; L. Wallace & Lemon, 2004). The method used for the SMOG calculations followed the methodology in the literature (Aldridge, 2004; Mumford, 1997; L. Wallace & Lemon, 2004). If SMOG calculations are calculated manually, three groups of 10 consecutive sentences at the beginning, middle and end of a document were selected, giving a total of 30 sentences. Following this, all words with three or more syllables within these selected sentences were counted and the square root of the total was then calculated and rounded to the nearest integer. Finally, the number 3 was added to the integer to obtain the grade level of the document.

However, the originator (McLaughlin, 1969) of the SMOG formula has also provided an internet-based version of the calculator at <http://webpages.charter.net/ghal/SMOG.html>; we compared manually calculated results with those derived from the internet version and found no difference between them. This calculation measures only the likely reading level required for comprehension of the material and not other aspects such as readability and

suitability which could be assessed using other tools such as the Readability Assessment Instrument (RAIN) (A. Adkins, Elkins, & Singh, 2001) or the Suitability Assessment of Materials measurement (SAM) (Doak, Doak, & Root, 1985). Issues of readability and suitability of wording are beyond the scope of this paper.

Findings

The readability of the material assessed within this study are summarised in Table 3 and range from primary school level (entry level 1, reading age 7) up to and beyond postgraduate level (level 2+, reading age 21). The majority of the health information sources assessed were at entry level 3, which means that the reader should be able to “understand short straightforward text on familiar topics accurately and independently and have the ability to obtain information from everyday sources” (*The Skills for Life Survey*, DfES 2003). The issue of ‘familiarity’ with the topic is of key importance within a health information context as the complexity of the language necessitates any written information being at a lower level than would be usual.

The NHS self-help guide and NHS parental advice page required people accessing the sites to have an average literacy level at level 1 or post secondary school level. The readability level was highest for information relating to symptoms and potential treatments for both of these sites. The treatment options in terms of obesity achieved a SMOG score of 22 (written at a post graduate level). This again raises the issue of terminology and the complexity of language used. In an attempt to address this issue the NHS Direct self-help guides have a ‘click through’ glossary of terms for unfamiliar medical terms. However, when the glossary itself was assessed for readability it was again found to be at level 1 or post secondary school level.

The health information materials available via the Patient UK web site and the condition specific sites (Asthma UK; National Osteoporosis Society UK; Cancer BACKUP UK; Cancer Research UK and The Diabetes Society UK) were relatively readable compared to the materials from the NHS sites. In terms of their readability these sites were comparable to the printed leaflets from the pharmacies. Sections of text analysed from these sources was predominately at entry level 3 with the introductory text to most of the leaflets and condition specific sites readability level at entry level 2. Entry level 2 is that expected of a seven year

old and recognises the role of signs and symptoms in understanding and comprehension of text.

INSERT TABLE 3 ABOUT HERE

Conclusions and Managerial Implications

The findings should be of concern to designers of printed and Internet health information sources as much of the materials available is likely to not to be readily understood by a substantial section of the population. As noted previously, the result of misunderstanding or not fully comprehending health related information has the potential to be life threatening.

The increased proliferation of health information generated from a variety of sources, such as pamphlets, self-help groups and the Internet, suggests that the demand from consumers for health information is growing. There is a need for mechanisms to be developed that check material is written at a level appropriate for the intended audience and to ensure it is understandable as the success of social marketing interventions aimed at addressing specific issues facing all members of the European Union will in part depend comprehension of the information provided.

Directions for Future Research

There is an absence of cross-country studies of literacy challenges and potential solutions, both for conventional print and Internet-based material. There are a number of readability indices that are based around sentence length and number of syllables (e.g., Flesch – Kincaid grade level; Flesch reading ease index; The Fry Graph and SMOG readability index). However, these readability measures were designed for application to general text and not medical text, so there is a possibility that the use of such measures could be overestimating readability scores. In addition, there is a need for health information sources to be assessed for their suitability for the given target audience. An area for future consideration is the development of a suitable framework to assess content that considers the use of graphics, the reader's level of prior knowledge and the implications of social and cultural appropriateness.

A further area for research is the appropriateness of readability measures developed for English material if it is used for other languages as there are in existence only limited foreign language adaptations, such as from the 1980s of the Flesch reading ease index (Spanish Language Huerta reading ease index) and The Fry Graph. (Contreras, Garcia-Alonso, Echenique, & Daye-Contreras, 1999) used the SMOG readability index on Spanish, English and French text.

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Table 1 Magnitude (in USA) of Issues Social Marketing may Contribute Towards
 (Philip. Kotler, Roberto, & Lee, 2002)

Issue	Magnitude
Alcohol use during pregnancy	Estimated 5,000 infants born with fetal alcohol syndrome each year
Sexually transmitted diseases	40% of sexually active high school students report not using a condom
Diabetes	About 1/3 of the nearly 16 million people with diabetes are not aware they have the disease
Skin cancer	Approximately 70% of American adults do not protect themselves from the sun's dangerous rays
Breast cancer	More than 20% of females aged 50 and over have not had mammograms in the last two years
Prostrate cancer	Only about half of all prostrate cancers are found early
Colon cancer	Only about 1/3 of all colon cancers are found early
Seat belts	An estimated 30% of drivers and adult passengers do not always wear their seat belts
Fires	Almost 50% of fires and 60% of fire deaths occur in the estimated 8% of homes with no smoke alarms

Table 2: Reading Skill Level by Age Cohort as indicated in the literature and the National Standards for literacy (see, for example, Hoffman et al. 2004; Wallace and Lemon 2004; Department for Education and Skills – DfES, 2003).

<i>School level</i>	<i>Approximate Age</i>	<i>Approximate Grade/ Reading Skill Level Expected</i>	<i>UK National Curriculum Level</i>	<i>UK Adult Literacy Level</i>	<i>UK Population %</i>
<i>Nursery Junior / Primary School</i>	3-5	1	1	Entry Level 1	3
	6	2	1		
	7	3	2	Entry level 2	2
	8	4	2		
	9	5	2		
<i>Secondary School</i>	10	6	2	Entry level 3	11
	11	7	3		
<i>Further Education</i>	12	8	3		
	13	9	3		
	14	10	3		
	15	11	4		
	16	12	5	Level 1 Upper secondary attainment	40
	17	13	5		
	<i>Higher Education (College / University)</i>	18	14	6 to 8	Level 2 or above
19		15			

Table 3: SMOG reading level scores for the range of UK health information sources assessed.

Type of Materials	UK adult literacy level	SMOG reading grade level	
		Mean	Range
Pharmacy health information leaflets n = 12	Entry level 3	10.3	9 – 12
NHS Direct online Self-help guides:	Level 1		
Asthma		12.5	6 - 16
Smoking		13.5	11 – 16
Osteoporosis		12.2	10 – 16
Obesity		14.1	11 – 22
Diabetes		13.4	11 – 17
Cancer		12.6	9 – 16
NHS Parental Advice Page	Level 1		
Asthma		12.4	9 -18
Smoking		12.2	10 – 16
Osteoporosis		11.1	8 – 13
Obesity		13.3	9 – 17
Diabetes		13.3	9 – 14
Cancer		11.2	7 - 15
Patient UK	Entry level 3		
Asthma		9.1	7 – 16
Smoking		10.2	8 – 14
Osteoporosis		11.7	9 – 15
Obesity		12.2	10 – 14
Diabetes		9.2	8 – 15
Cancer		11.3	8 – 15
Asthma UK Web page	Entry level 3	9.2	7 - 14
National Osteoporosis Society UK	Entry level 3	9.3	8 – 13
Cancer BACKUP UK	Entry level 3	10.2	8 – 12
Cancer Research UK	Entry level 3	10.7	7 – 14
Diabetes Society UK	Entry level 3	9.5	8 – 13